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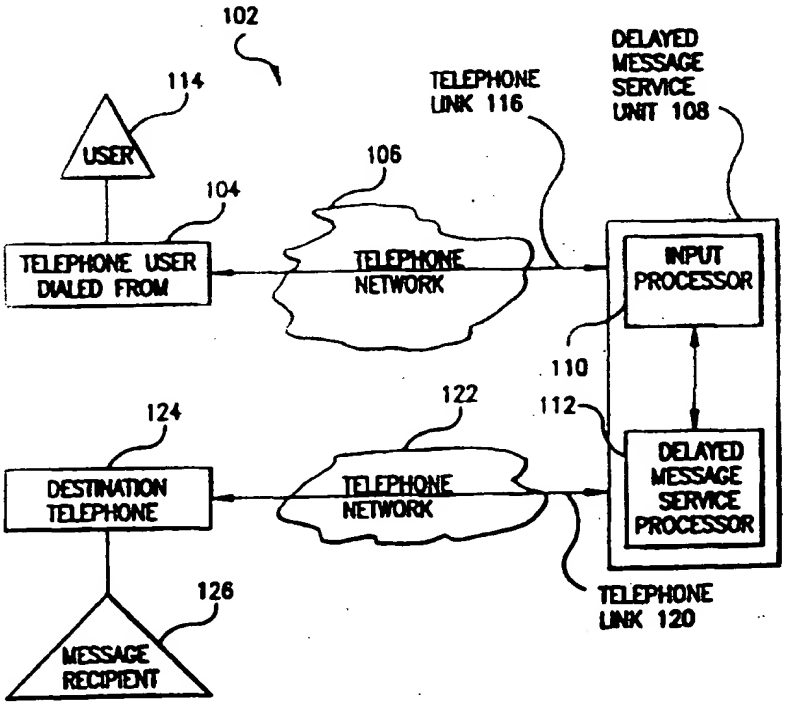
(57) Abstract

A system and method for delayed delivery of a telephone message are described. A user or calling party (114) wishing to deliver a telephone message to a message recipient or called party (126) at another time specifies the destination telephone number, the delivery time, as well as the telephone message to be delivered. This information is preferably input and stored by an input processor (110). To provide for delivery of the telephone message at the time specified by the calling party (114), the current time is accessed and compared to the delivery time. If the delivery time is equal to or prior to the current time, then delivery of the telephone message is initiated. The telephone message is delivered to the message recipient (126) by placing a telephone call to the destination telephone number specified by the user (114).



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System and Method for Delayed Delivery of a Telephone Message

Background of the Invention

Field of the Invention

The present invention relates generally to telecommunications, and more particularly, to delayed delivery of a telephone message. The present invention allows a telephone message to be delivered to a message recipient at a time specified by the calling party.

Related Art

Telephone communication is an integral part of the business and personal lives of most individuals in society today. The prevalence of telephone communication extends throughout the world. It is commonplace for an individual to have telephone communications with others who live in different time zones, as well as in different countries. It is also not uncommon for all of the adults living in a household to be working, so that they are not available to answer the telephone or to receive a telephone message until they have returned home from work at the end of the business day. The international nature of business today also necessitates the need for international telephone communications.

Due to the time zone differences between countries, it may be difficult to provide a telephone message to a party in another country. For example, the differing time zones between the United States and Hong Kong creates a day/night difference between these two countries. When an individual in the United States is at home and has time to talk to an individual in Hong Kong, say at 9:00 p.m., it is 10:00 a.m. in Hong Kong and the called party (message

recipient) is likely to be at work. This day/night time zone difference makes it difficult to provide a telephone message to the called party in Hong Kong when that party is likely to be home. Even if the called party is resident in the same time zone as the calling party, the called party may not be available to receive the telephone message until a particular time, such as after the called party has arrived home from work.

One conventional method for providing a message to an individual is through the use of a voicemail system. However, this requires the calling party to have access to the voicemail system. It also requires that the message recipient call in to retrieve the voicemail message.

Another conventional method for providing a message to a message recipient is through the use of a paging system. A paging system requires that the called party have a pager, and may also require that the called party make a telephone call to retrieve the complete message.

Yet another conventional method for providing a message to a message recipient is by having a calling party leave a message on an answering machine. However, this necessitates that the called party have an answering machine. Additionally, a conventional answering machine does not allow a telephone message to be sent at a time that is convenient and economical (i.e., off-peak rates) for the calling party. Additionally, a conventional answering machine does not ensure that the called party actually received and listened to the message. This problem does not exist if the message is delivered directly to the message recipient by calling when the message recipient will be available.

Particularly in developing countries, not everyone has access to a voicemail system, a paging system, or an answering machine. Thus, there is a need for a system for delivering telephone messages to a message recipient that requires only the use of a telephone by both the calling party and by the called party. There is a need for a system that enables the telephone message to be delivered to the message recipient without requiring that the message recipient make a telephone call to retrieve the telephone message. There is also a need for

a system that ensures delivery of the telephone message by calling when the message recipient is available.

Such a system would be particularly useful for allowing the calling party that wishes to deliver a telephone message to have that message sent at an off-peak rate that is more cost-effective for the calling party. Such a system would also be particularly useful in developing countries where not everyone has a telephone. Such a system could be used in that scenario to send a telephone message that indicates when a convenient time would be, so that both the called party and the calling party would be available and would have access to the telephone to conduct the conversation.

Summary of the Invention

The present invention is directed to a system and method that provides for delayed delivery of a telephone message. In one aspect of the invention, a method for delayed delivery of the telephone message is provided. This method includes storing a destination telephone number and a delivery time for the telephone message in a delayed message record. The telephone message that corresponds to the delayed message record is stored as a delayed delivery telephone message. The delayed message record is accessed to compare current time to the delivery time. The delayed delivery telephone message is delivered if the delivery time is equal to or prior to the current time. In one aspect of the invention, this is carried out by repeatedly accessing the delayed message record at a configurable time interval to compare current time to delivery time. The configurable time interval is selected to minimize the amount of time that the message is "overdue" for delivery.

To facilitate delayed delivery of the telephone message throughout the world, in another aspect of the present invention the delivery time and current time are converted to a universal time reference. Such a universal time reference can be, for example, Greenwich Mean Time (GMT).

In another aspect of the method of the present invention, billing information is received from the calling party. The billing information is then associated with the delayed message record.

In another aspect of the present invention, a system for delayed delivery of a telephone message is provided. The system includes an input processor for receiving and storing a destination telephone number for the telephone message, a delivery time for delivery of the telephone message, and a delayed delivery telephone message. The system also includes a delayed message service processor that compares current time with delivery time, and initiates delivery of the delayed delivery telephone message to the destination telephone number when the delivery time is equal to or prior to current time.

In yet another aspect of the present invention, a computer program product is provided that includes a computer-usable medium having computer logic recorded thereon that enables a processor to perform delayed delivery of a telephone message.

Features and Advantages

It is a feature of the present invention that the calling party wishing to send the delayed delivery telephone message can specify the time at which it is delivered to the message recipient.

It is a further feature of the present invention that the calling party can specify the delivery time with respect to the local time of the calling party, or the local time of the message recipient (called party).

It is an advantage of the present invention that the calling party can specify delivery of the telephone message at a more economical time when the calling party will be charged off-peak rates.

It is a further advantage of the present invention that telephone messages can be sent at off-peak times when telephone communications networks are not as busy, therefore increasing network efficiency for the carriers.

It is yet a further advantage of the present invention that a message recipient can receive a telephone message at a time convenient for the message recipient, without having to dial into a voicemail system. It is further advantageous that the only equipment required by the message recipient is access to a telephone.

It is still a further advantage of the present invention that it provides a simple and economical way for a calling party to have a telephone message delivered at a time that is convenient for the message recipient and economical for the calling party. It is further advantageous in that delivery of the telephone message is ensured by calling when the message recipient is available.

Further features and advantages of the invention, as well as the structure and operation of various embodiments of the invention, are described in detail below with reference to the accompanying drawings. In the drawings, like reference numbers generally indicate identical, functionally similar, and/or structurally similar elements. The drawing in which an element first appears is indicated by the left-most digit in the corresponding reference number.

Brief Description of the Figures

The present invention will be described with reference to the accompanying drawings, wherein:

FIG. 1 is a block diagram of a telecommunications environment according to a preferred embodiment of the present invention;

FIG. 2 is a block diagram of a computer system useful for implementing components of the present invention;

FIG. 3 is a flowchart illustrating how a user requests and inputs information in order to send a delayed delivery telephone message;

FIG. 4 is a flowchart illustrating delayed message service call processing; and

FIGs. 5A and 5B illustrate flowcharts for delayed message delivery processing.

Detailed Description of the Preferred Embodiments

Overview of the Invention

The present invention is directed to a system and method for enabling a user to leave a telephone message that is delivered to a message recipient (called party) at another time. The message recipient receives a telephone call at the time specified by the user. By user is meant a calling party who uses the delayed message service to specify the time of delivery of a telephone message to a message recipient. This enables the telephone message to be delivered to the message recipient at a convenient time for the message recipient, and to be sent by the telephone network at a time that is more economical for the user. The user wishing to have the delayed telephone message delivered places a telephone call to access the delayed message service. The user is prompted to record the message to be delivered, and to identify the telephone number of the message recipient and the time that the message is to be delivered. The message recipient then automatically receives the telephone call delivering the telephone message at the time specified by the user. The message recipient does not have to make a separate call to retrieve the telephone message. The message recipient does not need any equipment other than a telephone to receive the telephone message.

The invention is adapted for use with a conventional telephone having, for example, a keypad with twelve keys (i.e., 1, 2, 3, 4, 5, 6, 7, 8, 9, 0, *, and #). It is to be understood that other types of telephone keypads may also be used with the present invention. Such a telephone transmits DTMF (dual tone multiple

frequency) signals, or other similar types of signals, in response to a user's depression or manipulation of the telephone's keypad. The invention may also be used with telephones having an input or dialing mechanism other than a keypad, such as telephones having a rotary dialer.

FIG. 1 is a block diagram of a telecommunications environment **102** in which the invention is used. A user **114** dials a telephone **104** to establish a telephone link **116** via a telephone network **106** with a delayed message service unit **108**.

Telephone link **116** between user **114** and delayed message service unit **108** is established in a conventional manner. Preferably, user **114** dials a telephone number associated with the delayed message service to initiate the establishment of telephone link **116** between user **114** and delayed message service unit **108**. Telephone link **116** represents any combination of communication mediums.

Delayed message service unit **108** preferably includes an Audio Response Unit (ARU) to provide audible commands, menu choices, instructions, and messages to user **114** via telephone link **116**. Delayed message service unit **108** also preferably includes a Voice Response Unit (VRU) to receive audible commands, menu choices, instructions and information from user **114** via telephone link **116**.

User **114** manipulates the input mechanism of telephone **104** to transmit commands and information to delayed message service unit **108** via telephone link **116**. Alternatively, commands and information can be provided to delayed message service unit **108** via telephone link **116** as audible information. For purposes of discussion, it is assumed that telephone **104** includes a touch tone keypad. Telephone **104** transmits a DTMF signal over telephone link **116** each time a key on a keypad is pressed.

Delayed message service unit **108** includes an input processor **110** to process signals and information received from telephone **104** over telephone link **116**. Input processor **110** processes the signals and information to establish a

delayed message record associated with the user's request. The delayed message record includes a destination telephone number for a destination telephone 124 of a message recipient 126. The delayed message record also includes a delivery time for delivery of the telephone message to message recipient 126. Input processor 110 also receives and stores the telephone message that is to be delivered at the delayed time specified by user 114.

The information stored and received by input processor 110 is accessible by a delayed message service processor 112 also included in delayed message service unit 108. As described in more detail below, delayed message service processor 112 compares the current time with the delivery time specified by user 114, and initiates delivery of the telephone message when the specified delivery time is equal to or prior to the current time.

The telephone message is delivered to message recipient 126 by establishing a telephone link 120 with destination telephone 124 via a telephone network 122 in a well known manner.

Implementation of the Invention

Delayed message service unit 108 is preferably implemented using a computer system, such as computer system 202 shown in FIG. 2. Alternatively, delayed message service unit 108 comprises a plurality of computer systems, each like computer system 202. In this alternate embodiment, input processor 110 is one computer system, and delayed message service processor 112 is another computer system. Other distributions of input processor 110 and delayed message service processor 112 among computer systems are within the scope and spirit of the present invention.

Computer system 202 includes one or more processors, such as central processing unit (CPU) 204. CPU 204 is connected to a communication bus 206.

Computer system 202 also includes a main memory 208, preferably random access memory (RAM). Control logic 210 (i.e., software) is stored on main memory 208.

Computer system 202 also includes a secondary storage 212. Secondary storage 212 includes, for example, a hard disk drive 214 and/or a removable storage drive 216, representing a floppy disk drive, a magnetic tape drive, a compact disc drive, or the like. Removable storage drive 216 reads from and/or writes to a removable storage unit 218 in a well known manner.

Removable storage unit 218, also called a program storage device or a computer program product, represents a floppy disk, magnetic tape, compact disc, or the like. As will be appreciated, removable storage unit 218 includes a computer usable storage medium having stored therein computer software and/or data.

Computer programs (also called computer control logic) are stored in main memory 208 and/or secondary storage 212. Such computer programs, when executed, enable computer system 202 to perform the features of the present invention as discussed herein. In particular, the computer programs, when executed, enable CPU 204 to perform the features of the present invention. Accordingly, such computer programs represent controllers of computer system 202.

Computer system 202 also includes an audio unit 220, such as a speech synthesizer, recording output device, or the like. Computer system 202 uses audio unit 220 to transmit audible signals to telephone 104 and to telephone 124 over telephone links 116, and 120, respectively, in a well known manner.

Computer system 202 further includes an input/output interface 222 for interacting with external devices. For example, input/output interface 222 enables computer system 202 to connect to telephone network 106 and to telephone network 122.

In another embodiment, the present invention is directed to a computer program product comprising a computer readable medium having control logic

(computer software) stored therein. The control logic, when executed by CPU 204, causes CPU 204 to perform the functions of the present invention as described herein.

In another embodiment, computer system 202 is appropriately integrated with a telecommunications switch in order to process calls from telephone link 116 at, or in close proximity to, the switch.

In yet another embodiment, the present invention is implemented primarily in hardware using, for example, one or more state machines. Implementation of the state machines to perform the functions described herein would be readily apparent to persons skilled in the relevant arts.

Operation of the Delayed Message Service

FIG. 3 is a flowchart 300 illustrating how a user requests and inputs information in order to send a delayed telephone message. Flowchart 300 represents the delayed message service process from the perspective of user 114. Flowchart 300 begins with a step 302 indicating the start of the delayed message service use. Control immediately passes to a step 304.

In step 304, a user such as user 114 dials a designated delayed message service telephone number. In one embodiment, the delayed message service is a free service with no charge to access the service. User 114 is, however, charged for the connect time incurred in delivering the delayed telephone message. In a free service embodiment, the delayed message service telephone number is a toll-free "1-800" telephone number, such as "1-800-MSG-DELAY." In other embodiments, the delayed message service is a pay-to-dial service (such as a "1-900" service) in which the message recipient (called party) pays for the call. In yet other embodiments, the calling party pays a service fee to invoke the delayed message service.

In a step 306, the delayed message service answers. This answering can be provided by an audio response unit (ARU). Upon answering, input processor

110 via audio unit 220 audibly announces a brief greeting to user 114, such as "Welcome to the delayed message service". Alternatively, the delayed message service answering and greeting can be performed by a live operator. In the following discussion, it is to be understood that the audible prompting of user 114 can be carried out either by input processor 110 via audio unit 220, or via a live operator.

In a step 308, user 114 is prompted to specify the method of payment. The method of payment is preferably one of two choices: (1) bill to telephone number of telephone 104; or (2) bill to a credit card, a calling card, or the like. For example, user 114 can be prompted as follows, "Press 1 to bill to telephone currently in use, and press 2 to bill to a credit card or calling card." In a step 310 it is determined whether user 114 wishes to have the billing directed to the telephone number of the telephone that user 114 has dialed from, or whether user 114 wishes to specify a credit card number or calling card number for billing. If user 114 wishes to specify a credit card number for billing, then a step 312 is executed to prompt user 114 to specify the credit card number. User 114 can specify the credit card number by audibly announcing the number, or pressing the appropriate numbered keys on the telephone keypad, followed, for example, by "#." The credit card number may then be validated through entry of a Personal Identification Number (PIN).

After user 114 has specified the method of payment through execution of steps 310 and 312, a step 314 is carried out. In step 314, user 114 is prompted to enter the telephone number of message recipient 126 (called party). Such a prompt can be, for example, "Please enter the number for the person you are calling." User 114 then enters the telephone number of destination telephone 124 to which message recipient 126 has access. User 114 can specify the telephone number by pressing the appropriate numbered keys on the telephone keypad of telephone 104. Alternatively, the telephone number of destination telephone 124 can be input by user 114 by audibly announcing the telephone number to a voice response unit (VRU), or to a live operator. Step 314 also provides for optionally

having user 114 review and confirm that the telephone number has been properly received and entered by delayed message service unit 108.

Once the destination telephone number has been properly entered, a step 316 is carried out. In step 316, user 114 is prompted to enter the date and time for delayed delivery of the telephone message to message recipient 126. As in step 314, step 316 can provide for optionally having user 114 review and confirm the date and time for delayed message delivery.

In one embodiment, user 114 is prompted to enter the delayed delivery date and time with reference to the time zone of user 114. In another embodiment, user 114 is prompted to enter the delayed delivery date and time with reference to the time zone of message recipient 126. In yet another embodiment, user 114 is prompted to select between user 114's time zone and message recipient 126's time zone as the reference for the delayed delivery date and time.

It is to be understood that the delayed delivery date and time is a later point in time, i.e., after or subsequent to the current date and time. Once user 114 has specified the delayed delivery date and time, user 114 is prompted in a step 318 to record the telephone message to be delivered as a delayed delivery telephone message. As in steps 314 and 316, step 318 provides for optionally having user 114 review and re-record the message. Such prompting can be provided by a message such as "Please now record the message you wish to have delivered, and when you are finished, please indicate by hitting the pound key." User 114 then audibly announces the message that is to be delivered at the specified date and time to message recipient 126.

In an alternate embodiment, the user can be prompted that the message to be recorded cannot exceed a set, but configurable, time period. The user can be alerted that the recording time period is about to end by, for example, providing a series of rapidly repeating beeps.

Once the message to be delivered at the specified date and time has been recorded by user 114, the call is terminated in a step 320. The call can be

terminated by user 114 hanging up. Alternatively, the call can be terminated by delayed message service unit 108. For example, user 114 could be prompted to determine whether user 114 would like to specify another delayed delivery telephone message. If yes, processing would return to step 314 to prompt user 114 to enter the telephone number of the next message recipient. If no, the call would be terminated by delayed message service unit 108 in step 320. Delayed message service use by user 114 is terminated in a stop step 322.

FIG. 4 is a flowchart 400 illustrating delayed message service call processing. Flowchart 400 represents the delayed message service process from the perspective of delayed message service unit 108. Delayed message service call processing begins with a step 402, where control immediately passes to a step 404.

In step 404, a call is identified as a delayed message service call, and connection is established with delayed message service unit 108. Thereafter, in a step 406, a delayed message record is established for the call. In a preferred embodiment, the delayed message record is established by input processor 110. The delayed message record for the call is one record in a database of delayed message records. Such a database is accessible by input processor 110 and delayed message service processor 112, and will be referred to herein as the delayed message service database. The establishment of the delayed message service database and the associated delayed message records would be readily apparent to one of skill in the relevant arts.

In a decision step 408, it is determined whether user 114 wishes to have the billing directed to the telephone number of the telephone that user 114 has dialed from. This information is obtained from user 114 in response to steps 308, 310, and 312 in FIG. 3. If user 114 does wish to bill to the telephone number of the telephone dialed from, then in a step 410, the dialing telephone (telephone 104) billing information is associated with the delayed message record established for this call. In a preferred embodiment, this association is carried out

by entering the appropriate information (e.g., telephone number of telephone **104**) into the delayed message record for the call.

If user **114** does not wish to bill to the telephone number of the telephone dialed from, then in a step **412**, the credit card number billing information is associated with the delayed message record for the call in a step **412**. This association is also preferably carried out by entering the appropriate information (e.g., credit card number, name, and expiration date) into the delayed message record for the call.

After completion of either step **410** or step **412**, control passes to a step **414**.

In step **414**, the telephone number of destination telephone **124** for message recipient **126** is stored by input processor **110** in the delayed message record for the call. This information is obtained from user **114** in response to step **314** in FIG. 3.

In a step **416**, the delayed delivery date and time input by user **114** in response to step 316 of FIG. 3 is converted by input processor **110** to a message delivery GMT (Greenwich Mean Time). By converting the delayed delivery date and time to GMT, times throughout the world can be compared using a common reference without having to be concerned about time zones or local times that are different between user **114** and message recipient 126. It is to be understood that other universal time references can be used with the present invention. Particularly, the delayed delivery date and time can be converted to a universal delivery time referenced to a universal time reference.

In a step **418**, the message delivery GMT is stored by input processor **110** in the delayed message record for the current call.

In a step **420**, the message audibly announced by user **114** in response to step 318 shown in FIG. 3 is recorded. In a preferred embodiment, step **420** includes the step of identifying a storage address or address location for storing the recorded message, as well as the step of digitizing the message to store it in a digitized form. Preferably, input processor **110** and delayed message service

processor 112 can access the address location at which the recorded message is stored.

In a step 422, the address of the recorded message is stored in the delayed message record associated with the current call. Alternatively, the recorded message itself could be stored in the delayed message record.

In one embodiment of the present invention, flowchart 400 then terminates at a stop step 424. In an alternate embodiment of the present invention, processing proceeds from step 422 to a step 426. In step 426, a timer is initiated or spawned at the point when the delayed message service call terminates. In such an alternate embodiment, flowchart 400 then also terminates at step 424 after step 426.

FIGs. 5A and 5B illustrate a flowchart 500 for delayed message delivery processing. Flowchart 500 illustrates processing that is preferably carried out by delayed message service processor 112. Alternatively, the processing associated with flowchart 500 may be carried out by input processor 110. For purposes of the following discussion, it is assumed that the processing of flowchart 500 is carried out by delayed message service processor 112. Flowchart 500 begins with a step 502, where control immediately passes to a step 504.

In a step 504, the current system date and time is accessed. The current system date and time accessed in step 504 can be a date/time reference maintained by delayed message service unit 108. Alternatively, the current system date and time can be accessed by delayed message service processor 112 from another device on the telecommunications network.

In a step 506, the current system date and time accessed in step 504 is converted to current system GMT. Current system GMT produced in step 506 is referenced to GMT, for comparison with the message delivery GMT produced in step 416 in FIG. 4. Alternatively, current system date and time can be converted to a universal current time that is referenced to the same universal time reference as the delivery date and time.

In a step 508, it is determined whether all messages corresponding to delayed message records in the delayed message service database have been processed through flowchart 500 in FIG. 5A. If all messages for delayed delivery have been processed, then flowchart 500 stops in a step 516.

If all messages for delayed delivery have not been processed through flowchart 500 in FIG. 5A, then control passes to a step 510. In step 510, the next message delivery GMT is retrieved. In a preferred embodiment, step 510 is carried out by accessing the next delayed message record in the delayed message service database, and retrieving the message delivery GMT from that delayed message record.

In a step 512, it is determined whether the next message delivery GMT is "less than or equal to" the current system GMT. By "less than or equal to" is meant equal to or prior to with respect to time. If the message delivery GMT is equal to or prior to the current system GMT, then the message corresponding to the message delivery GMT is queued up for immediate delivery in a step 514. If the message delivery GMT is not equal to or prior to the current system GMT, then processing returns to decision step 508. In this manner, the message is delivered at the point it becomes "overdue".

In a preferred embodiment, step 514 is carried out by accessing the message recorded by user 114 that corresponds to the message delivery GMT identified as equal to or prior to current system GMT in step 512. The recorded message is then placed in a delivery queue for delivery queue processing by delayed message service processor 112.

Delivery queue processing is indicated by flowchart connector 5B in FIG. 5A. Referring now to FIG. 5B, delivery queue processing continues at flowchart connector 5B, where control immediately passes to a step 518. In step 518, it is determined whether all messages in the delivery queue have been delivered. If all messages have been delivered, then message processing terminates at a step 528.

If all messages have not been delivered, then processing continues at a step 520. In step 520, the next message is obtained from the delivery queue. In a step 522, telephone link 120 is established via telephone network 122 with the telephone number of destination telephone 124 that corresponds to the message received from the delivery queue in step 520. The telephone number of destination telephone 124 is obtained from the delayed message record that corresponds to the message received from the delivery queue.

In a step 524, it is determined whether destination telephone 124 has been answered. If destination telephone 124 is answered, then the recorded message is delivered in a step 526. The recorded message is delivered by playing back the digitized message recorded by user 114. This can be carried out by causing audio unit 220 to audibly announce the recorded message.

If destination telephone 124 is not answered, then processing returns to step 518 to repeat the processing loop shown in FIG. 5B until destination telephone 124 is answered.

Once the recorded message has been delivered in step 526, the recorded message is deleted from the delivery queue. Preferably, the corresponding delayed message record is also deleted from the delayed message service database.

In a preferred embodiment of the present invention, the processing of flowchart 500 is implemented as background processing that is repeatedly performed at a configurable time interval, such as every "N" minutes. For example, after "N" minutes since the last time of execution, the processing of flowchart 500 would be initiated. Processing would continue to identify all messages having a message delivery GMT equal to or prior to current system GMT. Once all messages in the delayed message service database have been processed through flowchart 500 shown in FIG. 5A, processing stops until expiration of the "N" minutes time interval. In such an embodiment, the delayed message record is repeatedly accessed to compare current time to delivery time at a configurable time interval. The configurable time interval is preferably

selected to minimize the amount of time that the message is "overdue" for delivery.

In an alternate embodiment, processing through flowchart 500 can be initiated at the expiration of the timer spawned in step 426, when the delayed message service call terminates. The time period of the step 426 timer can be configured to be just prior to the message delivery time. Such an embodiment ensures that the message is delivered before it is "overdue."

In yet another embodiment, processing through flowchart 500 can be initiated through an external interrupt that is received by delayed message service processor 112 from another device on the telecommunications network.

In an alternate embodiment, a live operator is used for some of the functions performed by delayed message service unit 108. Some live operator functions can include, for example, prompting the user to provide such information as the destination telephone number, etc. In such a live operator embodiment, the live operator has access to the delayed message service database for review, entry, etc. of information. The present invention can also be configured so that a live operator places the telephone call to destination telephone 124 at the delivery time specified by the user.

While various embodiments of the present invention have been described above, it should be understood that they have been presented by way of example only, and not limitation. Thus, the breadth and scope of the present invention should not be limited by any of the above-described exemplary embodiments, but should be defined only in accordance with the following claims and their equivalents.

What Is Claimed Is:

1. A method for delayed delivery of a telephone message comprising the steps of:

(1) storing a destination telephone number for the telephone message in a delayed message record;

(2) storing a delivery time for delivery of the telephone message in said delayed message record;

(3) storing the telephone message as a delayed delivery telephone message that corresponds to said delayed message record;

(4) accessing said delayed message record to compare current time to said delivery time; and

(5) delivering said delayed delivery telephone message if said delivery time is equal to or prior to current time.

2. The method of claim 1, further comprising:

(6) receiving billing information for delivery of said delayed delivery telephone message; and

(7) associating said billing information with said delayed message record.

3. The method of claim 1, wherein step (2) comprises:

(a) converting said delivery time to a message delivery Greenwich Mean Time (GMT); and

(b) storing said message delivery GMT as said delivery time.

4. The method of claim 3, wherein step (4) comprises:

(a) accessing current time;

(b) converting current time to current Greenwich Mean Time (GMT); and

(c) determining if said message delivery GMT is equal to or prior to current GMT.

5. The method of claim 1, wherein step (5) comprises:

(a) retrieving said delayed delivery telephone message from a delivery queue;

(b) establishing a telephone link with said destination telephone number; and

(c) playing said delayed delivery telephone message.

6. The method of claim 1, wherein said delayed delivery telephone message is stored in said delayed message record.

7. The method of claim 1, wherein a storage address for said delayed delivery telephone message is stored in said delayed message record.

8. The method of claim 1, wherein step (4) is repeatedly performed at a configurable time interval.

9. The method of claim 1, wherein step (4) is performed in response to expiration of a timer.

10. The method of claim 4, wherein step (4) is repeatedly performed at a fixed time interval.

11. A system for delayed delivery of a telephone message, comprising:

an input processor for receiving and storing a destination telephone number for the telephone message, a delivery time for delivery of the telephone message, and a delayed delivery telephone message; and

a delayed message service processor for comparing current time with said delivery time, and for initiating delivery of said delayed delivery telephone message to said destination telephone number when said delivery time is equal to or prior to current time.

12. The system of claim 11, wherein said input processor comprises:

means for converting said delivery time to a universal delivery time that is referenced to a universal time reference.

13. The system of claim 12, wherein said universal delivery time is referenced to Greenwich Mean Time (GMT).

14. The system of claim 12, wherein said delayed message service processor comprises:

means for converting current time to universal current time that is referenced to said universal time reference.

15. A computer program product comprising a computer-usable medium having computer program logic recorded thereon for enabling a processor in a computer system to perform delayed delivery of a telephone message, said computer program logic comprising:

receiving and storing means for enabling said processor to receive and store a destination telephone number for the telephone message, a delivery time for delivery of the telephone message, and a delayed delivery telephone message;

comparing means for enabling said processor to compare current time with said delivery time; and

delivery means for enabling said processor to initiate delivery of said delayed delivery telephone message when said delivery time is equal to or prior to current time.

16. The computer program product of claim 15, wherein said computer program logic further comprises:

converting means for enabling said processor to convert said delivery time to a universal delivery time that is referenced to a universal time reference, and to convert current time to universal current time that is referenced to said universal time reference.

17. The computer program product of claim 15, wherein said comparing means comprises:

means for enabling said processor to repeatedly retrieve at a configurable time interval said delivery time and current time.

18. The computer program product of claim 15, wherein said delivery means comprises:

means for enabling said processor to place said delayed delivery telephone message in a delivery queue.

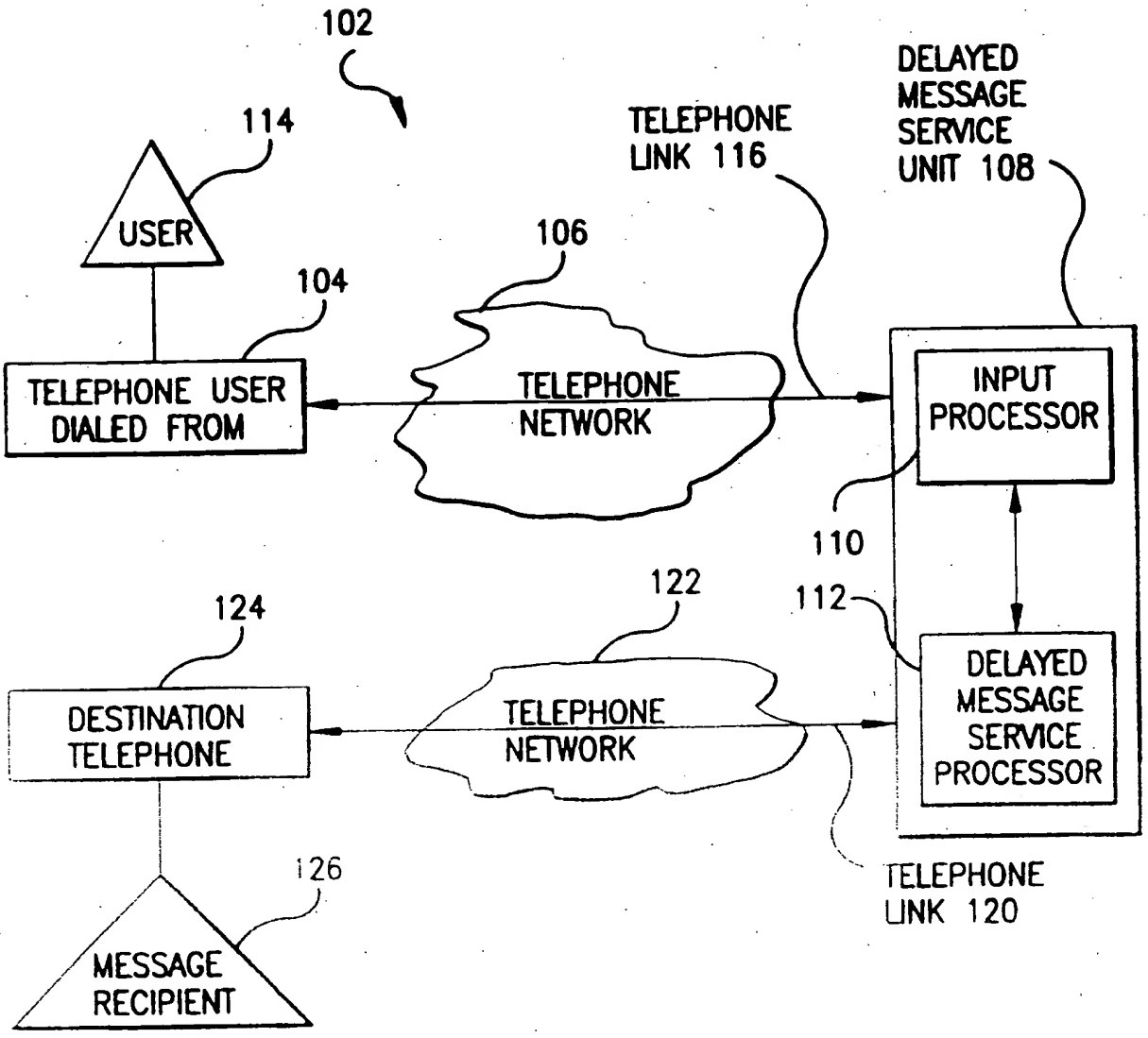
102
114
USER
104
TELEPHONE USER DIALED FROM
106
TELEPHONE NETWORK
TELEPHONE LINK 116
DELAYED MESSAGE SERVICE UNIT 108
INPUT PROCESSOR
110
112
122
124
DESTINATION TELEPHONE
TELEPHONE NETWORK
DELAYED MESSAGE SERVICE PROCESSOR
126
MESSAGE RECIPIENT
TELEPHONE LINK 120

FIG. 1

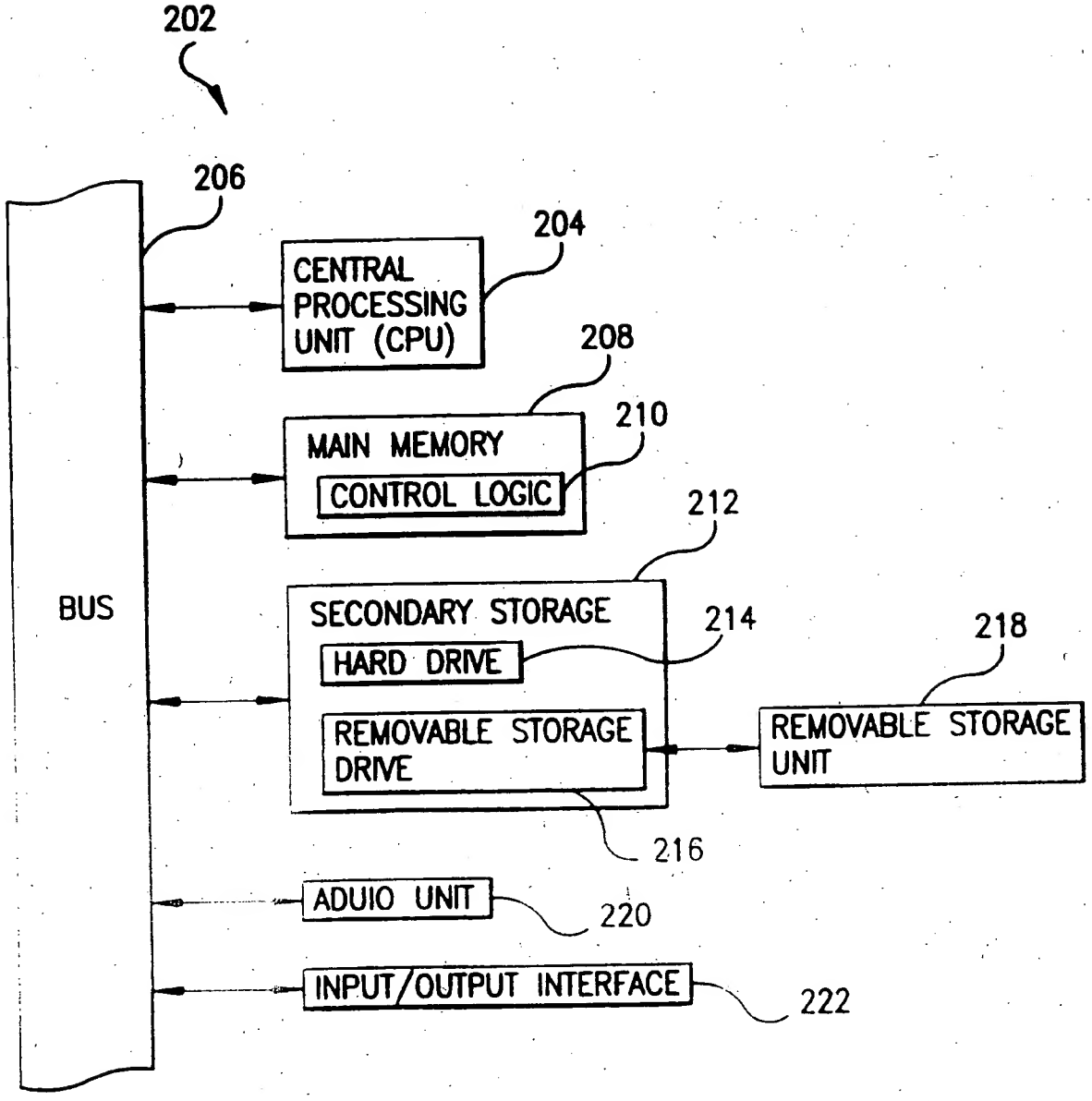
202
206
204
CENTRAL PROCESSING UNIT (CPU)
208
210
MAIN MEMORY
CONTROL LOGIC
212
BUS
SECONDARY STORAGE
214
218
HARD DRIVE
REMOVABLE STORAGE DRIVE
REMOVABLE STORAGE UNIT
216
ADUIO UNIT
220
INPUT/OUTPUT INTERFACE
222

FIG.2

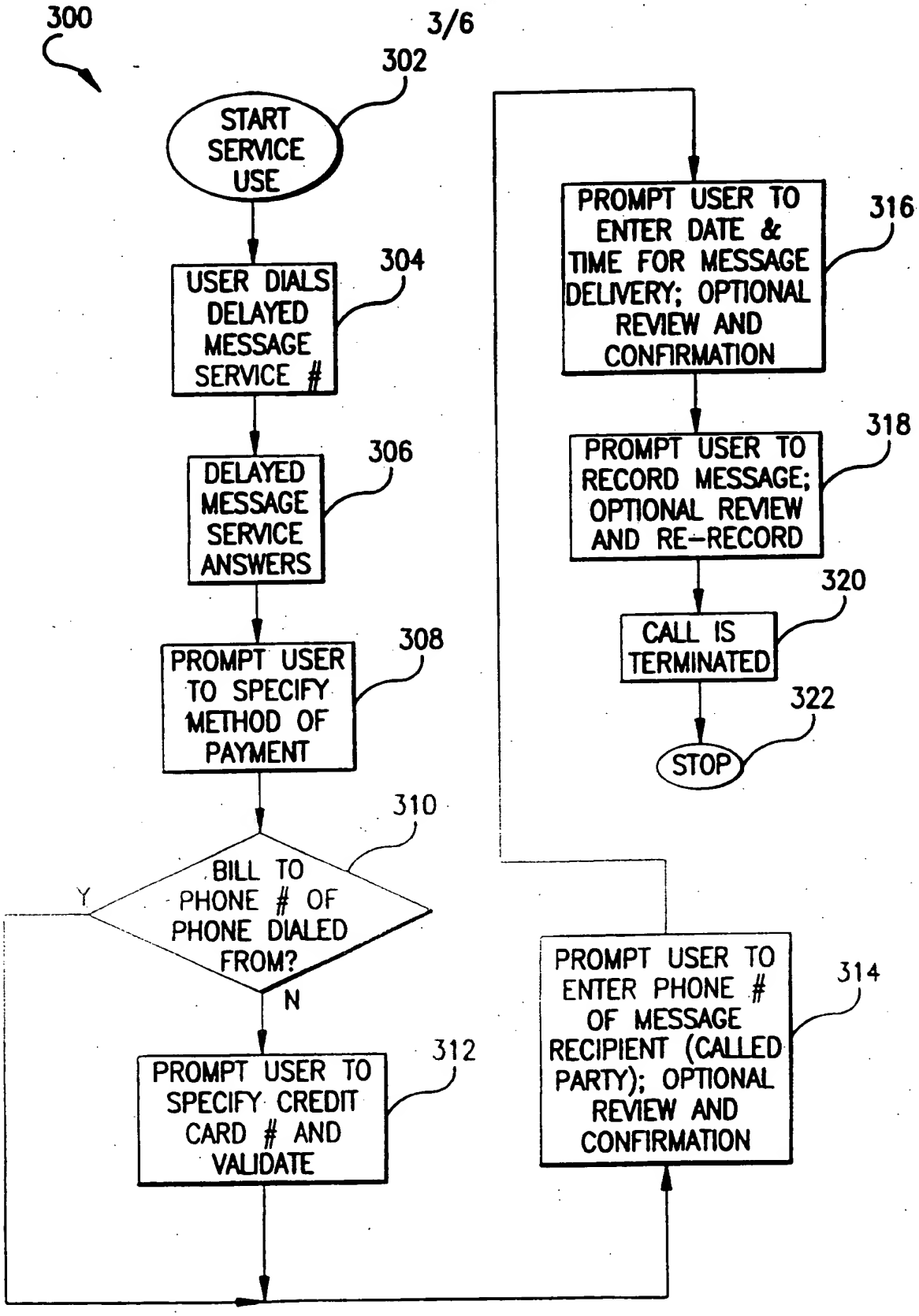
300
302
START SERVICE USE
304
USER DIALS DELAYED MESSAGE SERVICE #
306
DELAYED MESSAGE SERVICE ANSWERS
308
PROMPT USER TO SPECIFY METHOD OF PAYMENT
310
BILL TO PHONE # OF PHONE DIALED FROM?
Y
N
312
PROMPT USER TO SPECIFY CREDIT CARD # AND VALIDATE
314
PROMPT USER TO ENTER PHONE # OF MESSAGE RECIPIENT (CALLED PARTY); OPTIONAL REVIEW AND CONFIRMATION
316
PROMPT USER TO ENTER DATE & TIME FOR MESSAGE DELIVERY; OPTIONAL REVIEW AND CONFIRMATION
318
PROMPT USER TO RECORD MESSAGE; OPTIONAL REVIEW AND RE-RECORD
320
CALL IS TERMINATED
322
STOP

FIG.3

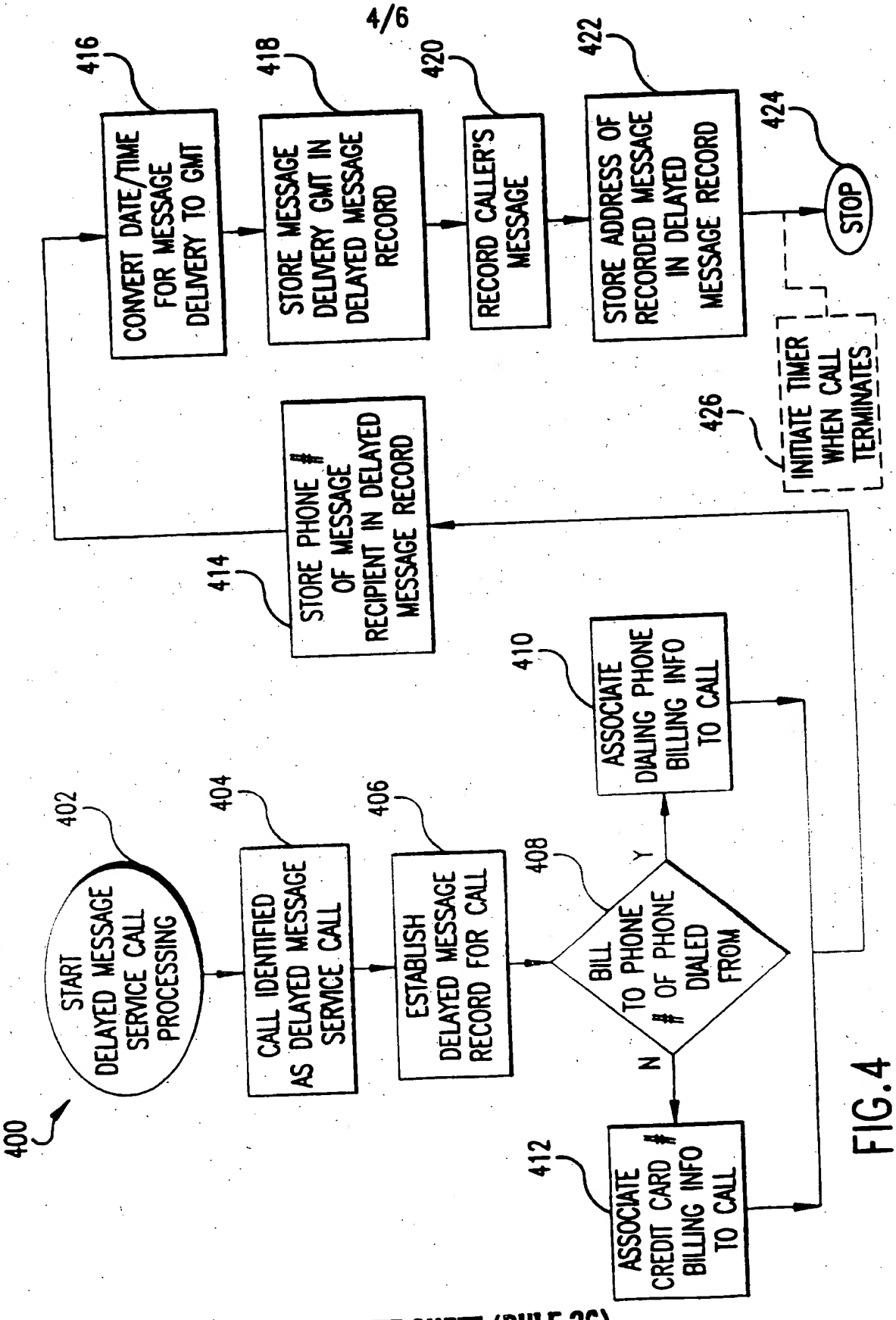
400
START DELAYED MESSAGE SERVICE CALL PROCESSING
402
CALL IDENTIFIED AS DELAYED MESSAGE SERVICE CALL
404
ESTABLISH DELAYED MESSAGE RECORD FOR CALL
406
BILL TO PHONE # OF PHONE DIALED FROM
408
Y
N
ASSOCIATE DIALING PHONE BILLING INFO TO CALL
410
ASSOCIATE CREDIT CARD # BILLING INFO TO CALL
412
STORE PHONE # OF MESSAGE RECIPIENT IN DELAYED MESSAGE RECORD
414
CONVERT DATE/TIME FOR MESSAGE DELIVERY TO GMT
416
STORE MESSAGE DELIVERY GMT IN DELAYED MESSAGE RECORD
418
RECORD CALLER'S MESSAGE
420
STORE ADDRESS OF RECORDED MESSAGE IN DELAYED MESSAGE RECORD
422
STOP
424
INITIATE TIMER WHEN CALL TERMINATES
426

FIG. 4

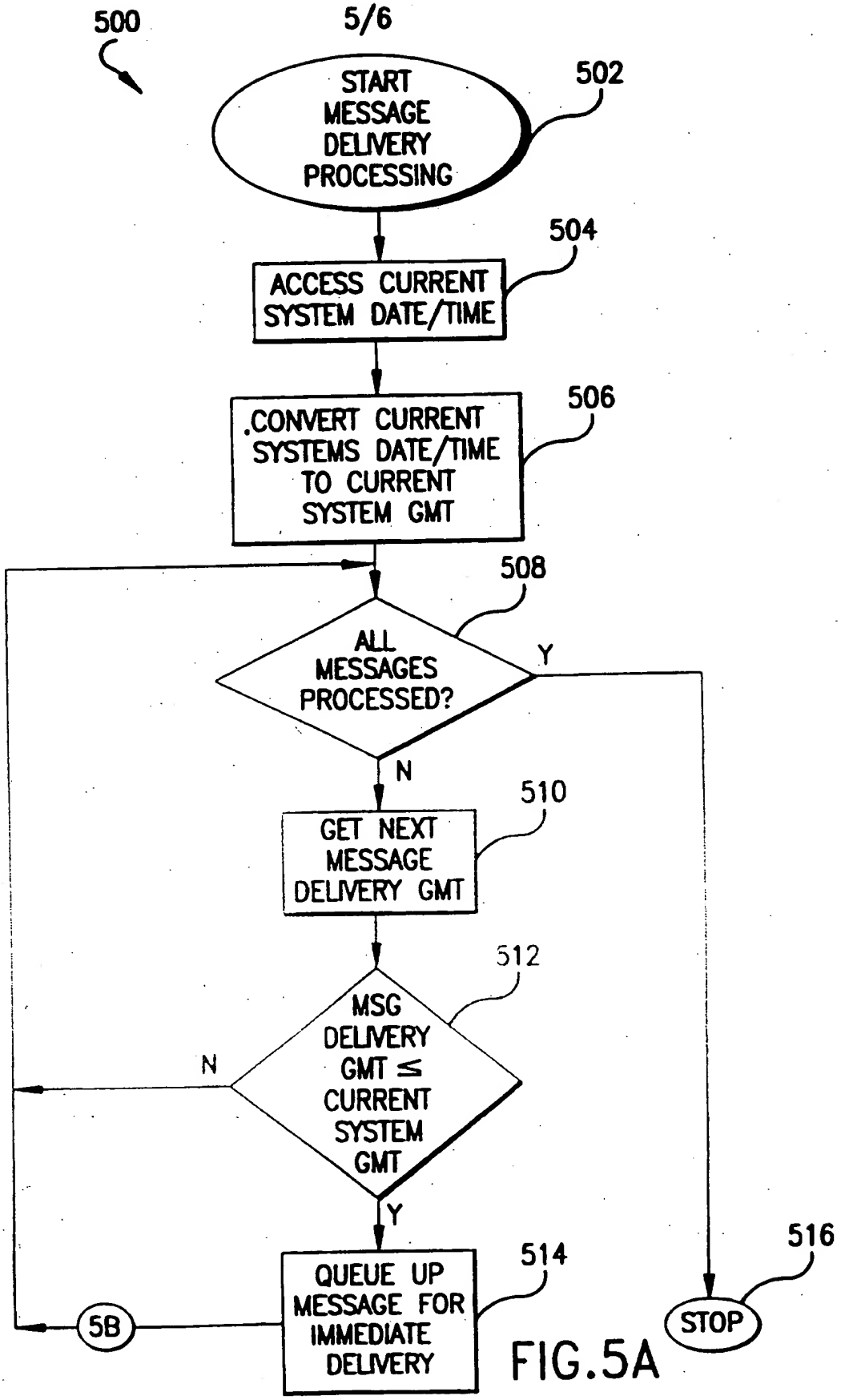
500
START MESSAGE DELIVERY PROCESSING
502
ACCESS CURRENT SYSTEM DATE/TIME
504
CONVERT CURRENT SYSTEMS DATE/TIME TO CURRENT SYSTEM GMT
506
ALL MESSAGES PROCESSED?
508
Y
N
GET NEXT MESSAGE DELIVERY GMT
510
MSG DELIVERY GMT ≤ CURRENT SYSTEM GMT
512
N
Y
QUEUE UP MESSAGE FOR IMMEDIATE DELIVERY
514
5B
STOP
516

FIG.5A

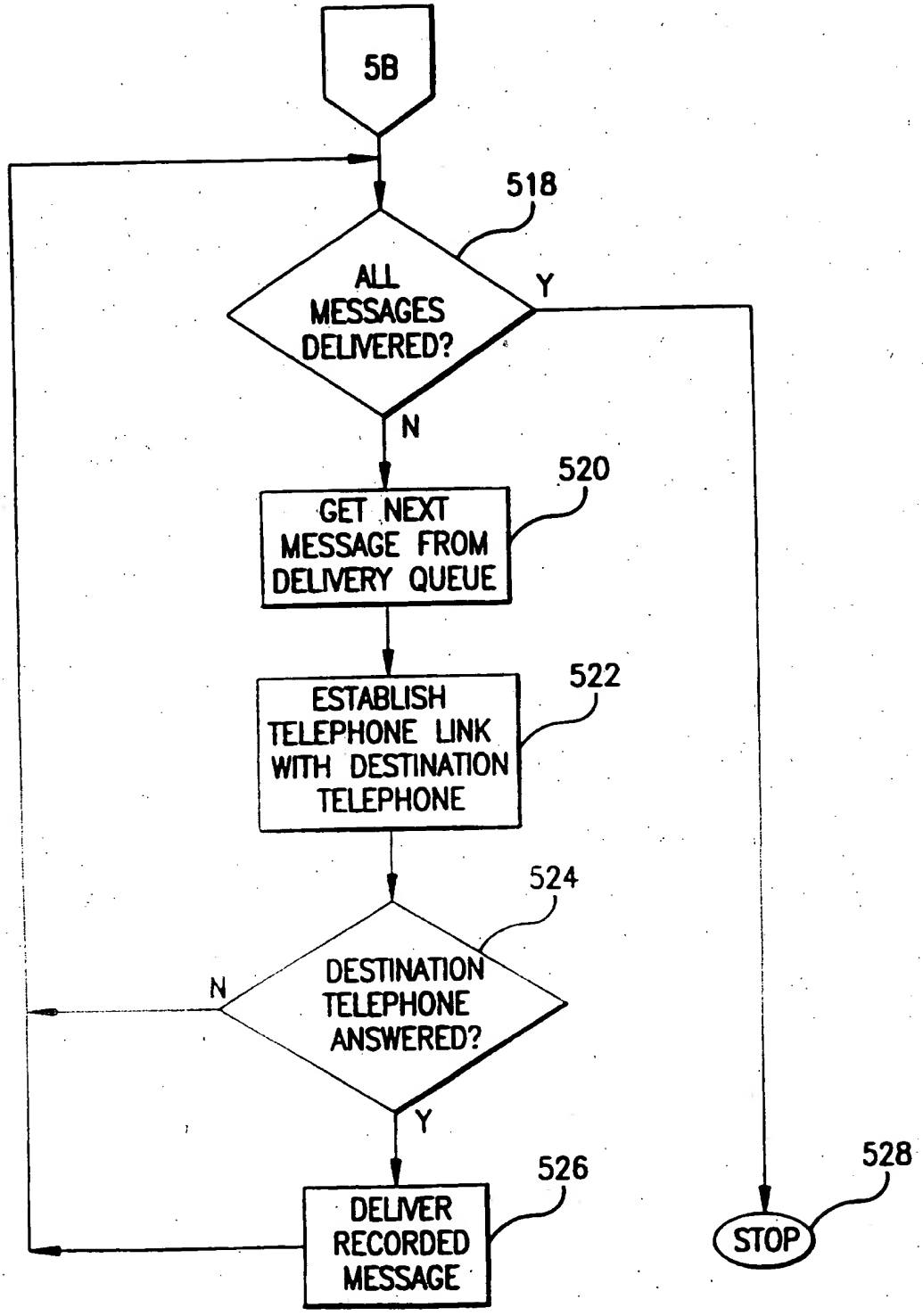
5B
518
ALL MESSAGES DELIVERED?
Y
N
520
GET NEXT MESSAGE FROM DELIVERY QUEUE
522
ESTABLISH TELEPHONE LINK WITH DESTINATION TELEPHONE
524
DESTINATION TELEPHONE ANSWERED?
N
Y
526
DELIVER RECORDED MESSAGE
528
STOP

FIG.5B

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US97/10495

A. CLASSIFICATION OF SUBJECT MATTER

IPC(6) :H04M 1/64
US CL :379/88

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 379/88, 67, 89

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5,333,180A (BROWN ET AL) 26 JULY, 1994, FIGS.2-4 AND COL.14-16	1,2,5-9,11,15,18
Y		3, 4, 10, 12-14,16,17
X	US 4,625,081A (LOTITO ET AL) 25 NOVEMBER 1986, FIGS.18,19,22,26 AND COL.9, LINES 48-60.	1, 11, 15
Y	US 5,140,419 A (Galumbeck et al) 18 August,1992, cols. 3-4 and col.11, lines 1-40.	3,4,10, 12-14.16, 17

☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

*	Special categories of cited documents:	"T"	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A"	document defining the general state of the art which is not considered to be of particular relevance	"X"	document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"E"	earlier document published on or after the international filing date	"Y"	document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"L"	document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"&"	document member of the same patent family
"O"	document referring to an oral disclosure, use, exhibition or other means		
"P"	document published prior to the international filing date but later than the priority date claimed		

Date of the actual completion of the international search 20 AUGUST 1997	Date of mailing of the international search report 19 NOV 1997
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Form PCT/ISA/210 (second sheet)(July 1992)*